piece. It is impossible to say that it is a fossil, nor could a fossil, unless previously silicified, be preserved in a rock so highly metamorphosed.

"I *do not* believe it to have been a pebble. The extremely elongate form and elliptical section would in my opinion preclude that view of the matter.

"Should you ever obtain specimens of which you could spare a thin slice, it would be the best method of determining the nature of the material.

Fig. 4.

"The enclosed material lies apparently in the plane of the bedding or lamination of the enclosing rock. The substance is too thin to give an idea of the full original form, but from its outline I infer that it has been similar to the other specimen" (Fig. 5). "The outline is, in *my opinion*, quite too symmetrical for a pebble, and, while we have no evidence of its organic character, it is not easy to give any satisfactory explanation of its origin.

"The specimens are extremely interesting and others should be sought for. J. Hall."

Since the receipt of the above letters the other specimens have been sent to the writer by Dr. Stubbs.

On Pyrophyllite from Schuylkill County, Pennsylvania. By F. A. Genth.

(*Read before the American Philosophical Society, July* 18, 1879.)

One of the most interesting varieties of pyrophyllite is that from the coal slates of the "North Mahanoy Colliery" (old Silliman Colliery) near Mahanoy City, Schuylkill county, Pa.

It had been mistaken for damourite, until, by chemical analysis, I established its true character.

I am indebted to Mr. Eli S. Reinhold, of Mahanoy City, for specimens and for the following information with reference to its occurrence.

In the bed, known as "Buck Mountain," it is usually found in horizontal seams, parallel with the coal beds, although it occurs at times in irregular seams in other directions. Thus far it has not been found in any of the other beds of the same mine, and only this mine has furnished it, although the bed in which it occurs is worked in other mines. It also is observed as marking or constituting the plant impressions on the coal slates at this locality.

It is found in thin seams of a delicate fibrous structure. At first glance much resembling the serpentine-variety "chrysotile." It seems that this pyrophyllite has been filling up cavities and cracks in the coal slate, and the exceedingly delicate impressions left by the coal plants in the slate are, after their decay, filled up with pyrophyllite material. Then, it is often not thicker than the finest tissue paper, but still shows, when magnified, the fibrous appearance. In larger cracks it seems to have crystallized from above and from below, and the two seams, thus formed, are mostly separated by a thin layer of pyrite in minute crystalline masses, which leave the impressions of their crystals upon the pyrophyllite. Frequently the fibrous pyrophyllite, as well as the pyrite, are coated with a very thin layer, not thicker than the finest tissue paper, of a *scaly* variety of pyro-

phyllite of an almost silver-white color, and of silky lustre.* The thickest seams of the fibrous pyrophyllite, which I have seen, were 9^{mm} in thickness, separated in the middle by a layer of pyrite.

The purest specimens have a white to yellowish-white color, and a lustre between silky and pearly, the latter especially visible when magnified; the fibrous particles show a somewhat laminated structure. Very soft. Spec. Gr. = 2.804.

Infusible, but strongly exfoliating when heated, leaving a mass of snow-white silky fibres.

Not decomposed by sulphuric nor hydrofluoric acids, nor by a mixture of both.

The analysis made with perfectly pure material gave the composition of pyrophyllite, corresponding to the formula: $Al_2 Si_4 O_{11} + H_2O$.

		Found.		Calculated.
Silicic Acid	=	66.61	—	66.52
Alumina	=	27.63	—	28.49
Ferric Oxide	=	0.16	—	——
Magnesia	=	0.10	—	——
Water	=	5.43	—	4.99
		99.93		100.00

This occurrence of pyrophyllite in coal slates and as the petrifying material of coal plants is exceedingly interesting, and I believe it to be the first time that it has thus been observed.

Prof. Gümpel noticed that a mineral resembling pyrophyllite constitutes the mass of many graptolites, but Prof. von Kobell has shown, by analysis of specimens from Nordhalben, near Steben in Upper Franconia, that this substance is *not* pyrophyllite, but a micaceous mineral, containing over 3% of potassium oxide, which he called "gümpelite."

The petrifying material of coal plants in the Tarantaise in Savoy has also been confounded with pyrophyllite, but we are now indebted to Prof. Gümpel for an investigation of this subject.† His analysis gave 6.803% of potassium oxide and 2.208% of sodium oxide. He has also made an analysis of the mineral of the graptolites from Graefenthal, in Thuringia, which gave 5.06% of oxides of potassium and sodium.

All these analyses show that the substances found as petrifying materials of coal plants in the Tarantaise and of graptolites are *not* pyrophyllite, but varieties, or perhaps mixtures, of micaceous minerals of greater or less purity, belonging to that group, which Prof. Dana puts under the head of *pinite*, and which are so frequently met with in nature as the results of alteration of numerous minerals, such as iolite, nephelite, scapolite, feldspars, staurolite, cyanite, corundum, topaz, &c., &c., which, when pure, would be recognized as damourite, paragonite, &c.

University of Pennsylvania, July 14, 1879.

* I could not get enough of it in a pure state for an analysis, but a partial analysis proved it to be pyrophyllite.

† G. Tschermak, Mineralogische und Petrographische Mittheilungen II. 2, 189.